

WO 2004/016531

PCT/IB2002/003321

-10-

CLAIMS

1.

A conveyor belt arrestor comprising a frame mountable to fixed structure of a conveyor belt installation and including a reaction member located operatively above the top run of a conveyor belt of the installation, a wedging structure located operatively beneath the top run of the conveyor belt and mounted for swinging movement in a vertical plane relative to the frame, a torsion spring arranged to be tensioned in use to apply a rotational bias to the wedging structure in a direction to swing the wedging structure upwardly, whereby in the event of the belt breaking and belt tension being lost, the torsion spring swings the wedging structure upwardly to lift the top run of the belt towards the reaction member such that the top run of the belt is trapped between the wedging structure and the reaction member by a wedging action that prevents movement of the top run of the belt in a direction opposite to its normal direction of forward travel.

2.

A conveyor belt arrestor according to claim 1 wherein the wedging structure includes an arm carried by a shaft rotatable relative to the frame and acted upon by the torsion spring.

3.

A conveyor belt arrestor according to claim 2 comprising torsion springs acting on opposite ends of the shaft.

4.

A conveyor belt arrestor according to any one of the preceding claims wherein the wedging structure comprises a plurality of wedge-shaped segments.

BEST AVAILABLE COPY

WO 2004/016531

PCT/IB2002/003321

-11-

5.

A conveyor belt arrestor according to any one of the preceding claims wherein the reaction member is a beam extending transversely over the belt between side structures of the frame.

6.

A conveyor belt arrestor according to any one of the preceding claims and comprising trapping means for trapping the bottom run of the conveyor belt in the event of belt breakage.

7.

A conveyor belt arrestor according to claim 6 wherein the trapping means comprises a fixed frame member located operatively beneath the bottom run of the belt, a trapping member located operatively above the bottom run of the belt and arranged to swing relative to the frame between an inoperative position clear of the bottom run of the belt and an operative position in which it traps the bottom run of the belt against the fixed frame member, and detent means arranged to hold the trapping member in the inoperative position during normal belt operation and, in response to upward swinging movement of the wedging structure, to release the trapping member to swing downwardly under gravity to the operative position.

8.

A conveyor belt arrestor according to claim 7 wherein the trapping member is carried by an arm on a rotatable shaft, the effective distance between this shaft and the fixed frame member being adjustable to cater for different thicknesses of conveyor belt.

BEST AVAILABLE COPY

WO 2004/016531

PCT/IB2002/003321

-12-

9.

A conveyor belt arrestor according to claim 8 wherein the rotatable shaft to which the arm carrying the trapping member is connected has ends which are rotatable in eccentric openings in members which are themselves rotatable relative to the frame to adjust the effective length of the arm.

10.

A conveyor belt arrestor according to any one of claims 8 to 10 wherein the detent means comprises a detent arm one end of which is pivoted to the wedging structure and the other end of which is engagable with the trapping member to hold the trapping member in its inoperative position during normal belt operation and which is arranged to disengage the trapping member when the wedging structure swings upwardly.

11.

A conveyor belt arrestor according to any one of the preceding claims and comprising auxiliary means, acting in addition to the torsion spring or springs, to swing the wedging structure upwardly in the event of belt breakage and loss of belt tension.

12.

A conveyor belt arrestor according to claim 10 wherein the auxiliary means comprises a roller supported rotatably by the frame and arranged to be rotated by the top run of the belt, a sub-shaft on the axis of the roller which can rotate relative to the roller during normal belt operation but which is locked relative to the roller in the event of reverse movement of the belt and corresponding reverse rotation of the roller, and a cord or the like, attached to the sub-shaft and to a point on the frame above the top run of the belt, which is arranged to be wound up on the sub-shaft and thereby to raise the roller and with it the top run of the belt in the event of reverse rotation of the roller.

BEST AVAILABLE COPY

WO 2004/016531

PCT/TB2002/003321

-13-

13.

A conveyor belt arrestor according to claim 11 and comprising a unidirectional bearing supporting the sub-shaft relative to the roller.

BEST AVAILABLE COPY